Creator: Kitzman & Shoskey
Program: Skilled Trades

Performance Task Project

ESSENTIAL QUESTIONS	
How do you create an accurate bid for a construction project? What factors are involved in calculating the cost of a project?	
SUBJECT MATTER CONTENT	
Construction Bids	
PRIOR KNOWLEDGE & MISCONCEPTION	
STUDENT WHO STRUGGLES	
The struggling student does not understand the implications of an inaccurate bid (either too high or too low). The student has poor mathematical skills and is unable to manipulate basic formulas and algebraic equations. They will turn in a sloppy hand written bid with a number that does not relate to measurements, costs of materials, and employees.	
STUDENT WHO IS TYPICAL	
Understands the importance of creating an accurate bid. The student has good mathematical skills but will struggle visualizing how all the components work together to create the bid.	
STUDENT WHO EASILY UNDERSTANDS	
Understands the importance of an accurate bid and the impact it has on the business profitability. This student has solid mathematical skills and is able to manipulate algebraic equations easily. They are also able to integrate the components of the bid to create a professionally, typed, bid with a cover letter to the district superintendent. The bid will include schematics.	

SCENARIO	
AUTHENTIC, REAL WORLD SITUATION	ROLE
You own a roofing company and the TBAISD Career-Tech Center is requesting bids to install a new membrane roof on a specific section of the school. The school requires that the project be completed in one week. Currently you have 7 employees, 6 earn $11.38/hour and one foreman earning $17.95/hour. Benefits per employee are $7.23/hour. You will also need to consider workman's compensation insurance rates in calculating the cost for personnel. To meet the one week deadline you may hire additional subcontracted labor for $16.23/hour plus workman's comp.	Roofing business owner
STAKES/OPPOSITION	
If the bid is over priced, your company will not be selected. If the bid is under priced, you will lose money. Your company is responsible for any damage resulting from rain during the tear off period.	
TASK LIBRARY	
Adhered Duro-Fleece® Roofing System Installation Manual	RELEVANT INFORMATION
Students will read the manual to determine the appropriate installation technique and adhesive mixture to apply.	
There is a lot of information in the manual and students will need to determine what information applies to the CTC roofing project.	HIGHER ORDER THINKING SKILLS USED (E.G. DISTRACTORS)
Employee Information	
Students will read the chart to calculate the total employee cost to complete the project. This document will also include the rates at which employees are expected to complete specific tasks. As an example: 900 square feet of roofing can be removed by 2 men in 1 hour.	RELEVANT INFORMATION

Students will analyze the data and determine the most cost efficient way to install the roofing system (current employees at overtime pay or subcontractors).	HIGHER ORDER THINKING SKILLS USED
Workman's Compensation Document **http://www.michigan.gov/wca/0,4682,7-191-26930-291369--,00.html**	
The workman's compensation rate for roofing employees.	RELEVANT INFORMATION
There will be many other personnel categories listed and students will need to sift through the document to locate the correct information.	HIGHER ORDER THINKING SKILLS USED
Adhesive Label	
Mixture instructions (ratio) and unit conversions will be needed by students to determine how much of each component is needed.	RELEVANT INFORMATION
The label will contain relevant information as well as irrelevant information. Students will need to determine what information applies to the bid process.	HIGHER ORDER THINKING SKILLS USED
News Articles on Membrane Roof Issues	
None.	RELEVANT INFORMATION
This is purely a distractor.	HIGHER ORDER THINKING SKILLS USED
Duro Last Roofing System: 12 Advantages of Being a Duro-Last Contractor	

None	RELEVANT INFORMATION
Information is irrelevant.	HIGHER ORDER THINKING SKILLS USED
Duro-Last Product Data Sheets **http://duro-last.com/pdf/engineering/specs/DL60_Membrane.pdf**	
Specific installation information (how many square feet a roll of Duro--Last will cover) and pricing information.	RELEVANT INFORMATION
Students will need to determine the correct price from a chart for the specific type of membrane needed for the roofing project. Some of the information is relevant and other information is not.	HIGHER ORDER THINKING SKILLS USED
Duro-Last Adhesive Data Sheet **http://duro-last.com/pdf/engineering/specs/Solvent_Based_Adhesive.pdf**	
Coverage and pricing information.	RELEVANT INFORMATION
Some of the information does not relate to the bid process.	HIGHER ORDER THINKING SKILLS USED
PROCESS	
HOW PROCESS REPLICATES REAL WORLD PROCESS	
The process of generating an accurate bid is essential to all construction trades business.	
PRODUCT	
DECISIONS TO BE MADE	

Students will determine the cost of the materials needed to roof the section of the school. Students will determine the most cost effective way to complete the project within the one week time frame required by the school (personnel decisions). Students will also incorporate a 30% profit into the estimate.	
AUTHENTIC PRODUCT TO BE PRODUCED	
Students will produce a bid for the roofing project which includes all associated material, personnel costs, and drawing of the project to scale.	
TRANSFER GOALS	
DATE BY WHICH STUDENTS WILL BE ABLE TO ACCOMPLISH A TASK/GOAL AND DESCRIPTION OF SUCH	
At the completion of the project students will understand the components of completing an accurate bid.	
DATE BY WHICH STUDENTS WILL BE ABLE TO ACCOMPLISH A TASK/GOAL AND DESCRIPTION OF SUCH	
At the completion of the project students will accurately manipulate formulae to calculate area of various shapes**.**	
DATE BY WHICH STUDENTS WILL BE ABLE TO ACCOMPLISH A TASK/GOAL AND DESCRIPTION OF SUCH	
At the completion of the project students will be able to write a professional bid for a construction project.	
DATE BY WHICH STUDENTS WILL BE ABLE TO ACCOMPLISH A TASK/GOAL AND DESCRIPTION OF SUCH	
OBSERVABLE PERFORMANCE	
IN COMPLETING THE PERFORMANCE TASK, WHAT STUDENT CAN DEMONSTRATE NOW (TOWARDS MASTERY OF THE ESSENTIAL QUESTION(S) AND PREPARATION FOR THE TRANSFER GOAL(S)	

1. Ability to read, comprehend, interpret and analyze text and graphical information. 2. Accurately manipulate area formulae. 3. Identify factors that impact the cost of a construction project. 4. Write a professional bid.	
CLASSROOM/PEDAGOGICAL PLAN	
1. Introduce project and bid process. 2. Students will work in small groups to determine the area to be roofed and allow for existing heating, cooling and venting components. 3. Students will read, analyze, and discuss the data to determine the amount and cost of materials. 4. Students will analyze personnel requirements for the project, keeping the one week time frame in mind, and determine the most cost effective way to man the project. 5. Each team will produce a bid for the job.	